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# NOTES ON THE FLORAL MORPHOLOGY AND ECOLOGY OF *MARGARITARIA DISCOIDEA* (EUPHORBIACEAE) AT MUFINDI, TANZANIA

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*Margaritaria discoidea* (Baillon) Webster is a common and widespread African tree found in deciduous woodland, fringing forest, dry evergreen forest, rainforest, and disturbed vegetation at altitudes from near sea level to over 2,000 m (Radcliffe-Smith, 1987). At Ngwazi, Mufindi District, Iringa Region, Tanzania (08°31'S, 35°10'E, altitude 1,850 m, rainfall 850 mm/year, mean monthly temperature from 17.5°C in January to 13.5°C in June with occasional frosts) *M. discoidea* var. *nitida* (Pax) R.-Sm. occurs as a tree 5 m tall in tree clumps associated with termite mounds in grassland. This variety also grows at the edges of planted wattle breaks (*Acacia mearnsii* De Wild., Leguminosae: Mimosoideae) and flowers in mid-October at the end of the dry season but before the start of the rains, which are initially short, heavy thunderstorms. The flowers are produced before and during a flush of leaves, and before the stipules fall. Old leaves can persist until just before the new leaf flush. The trees are generally dioecious, although one individual was seen with female flowers on a predominantly male tree (Lovett 3248, DSM, K, MO). Armstrong & Irvine (1989) observed a similar occurrence in the dioecious *Myristica insipida* R. Br. (Myristicaceae) of Queensland, Australia.

The *Flora of Tropical East Africa* (Radcliffe-Smith, 1987), followed taxonomically here, and Webster (1979) described *Margaritaria* as having four sepals and four stamens. However, in a sample of 1,000 flowers from a female tree (Lovett 3251, DSM, K, MO), 657 flowers had four sepals, 326 had five sepals, and 17 had six sepals. In a sample of 1,000 flowers from a male tree (Lovett 3247, DSM, K, MO), 8 had two stamens, 37 had three stamens, 926 had four stamens, and 29 had five stamens. On another tree a flower with six stamens was also seen. In male flowers the sepals are reflexed in a square, so are not as visible and easy to count as the sepals on female flowers. Female flowers were visited by ants and honey bees (*Apis mellifera*), which are kept at Ngwazi for honey production.

Associated species in the tree clumps include the trees: \**Albizia gummifera* (J. Gmelin) C. A. Smith var. *gummifera* (Leguminosae: Mimosoideae), \**Apodytes dimidiata* Arn. var. *dimidiata* (Icacinaceae), *Bequaertiodendron magalismontanum* (Sonder) Heine & J. Hemsley (Sapotaceae), \**Bersama abyssinica* Fresen. subsp. *abyssinica* var. *abyssinica* (Melianthaceae), *Buddleja salviifolia* (L.) Lam. (Loganiaceae), *Canthium lactescens* Hiern (Rubiaceae), *Carissa edulis* Vahl (Apocynaceae), \**Cassipourea malosana* (Baker) Alston (Rhizophoraceae), \**Catha edulis* (Vahl) Forsskal ex Endl. (Celastraceae), *Croton macrostachyus* Del. (Euphorbiaceae), *Cussonia arborea* Hochst. ex A. Rich. (Araliaceae), \**Cussonia spicata* Thunb. (Araliaceae), *Dais cotinifolia* L. (Thymelaeaceae), \**Diospyros whyteana* (Hiern) F. White (Ebenaceae), *Dombeya rotundifolia* Harvey (Sterculiaceae), \**Ekebergia capensis* Sparrman (Meliaceae), *Erythrina abyssinica* Lam. ex DC. subsp. *abyssinica* (Leguminosae: Papilionoideae), *Erythrina lysistemon* Hutch. (Leguminosae: Papilioideae), \**Euclea divinorum* Hiern (Ebenaceae), *Flacourtie indica* (Burman f.) Merr. (Flacourtiaceae), \**Garcinia kingensis* Engl. (Clusiaceae), *Heteromorpha arborescens* (Sprengel) Cham. & Schldl. (Apiaceae), *Maytenus cf. heterophylla* (Ecklon & Zeyher) N. Robson (Celastraceae), \**Olea capensis* L. (Oleaceae), \**Olinia rochetiana* Adr. Juss. (Oliniaceae), *Osyris abyssinica* Hochst. (Santalaceae), \**Peddiea fischeri* Engl. (Thymelaeaceae), \**Prunus africana* (Hook.f.) Kalkman (Rosaceae), \**Psychotria mahonii* C. H. Wright var. *puberula* (Petit) Verdc. (Rubiaceae), \**Rapanea melanophloeos* (L.) Mez (Myrsinaceae), \**Rothmannia fischeri* (Schumann) Bullock (Rubiaceae), \**Schrebera alata* (Hochst.) Welw. (Oleaceae), \**Syzygium guineense* (Willd.) DC. subsp. *afrmontanum* F. White (Myrtaceae), *Tarenna neuropophylla* (S. Moore) Bremek. (Rubiaceae), *Tecomaria capensis* (Thunb.) Spach subsp. *nyassae* (Oliver) Brummitt (Bignoniaceae), and \**Trichocladus ellipticus* Ecklon & Zeyher subsp. *malosana* (Baker) Verdc. (Hamamelidaceae). Climbers

include: *Asparagus setaceus* (Kunth) Jessop (Liliaceae), *Byrsocarpus orientalis* Baillon (Connaraceae), *Clematis hirsuta* Perrier & Guillaumin (Ranunculaceae), \**Dalbergia lactea* Vatke (Leguminosae: Papilionoideae), \**Dracaena laxissima* Engl. (Agavaceae), *Jasminum goetzeanum* Gilg (Oleaceae), *Keetia gueinzii* (Sonder) Bridson (Rubiaceae), *Rhus longipes* Engl. var. *longipes* (Anacardiaceae), *Rhoicissus tridentata* (L.f.) Wild & R. Drumm. (Vitaceae), \**Rubia cordifolia* L. subsp. *conotricha* (Gand.) Verdc. (Rubiaceae), *Smilax aspera* L. (Smilacaceae), and \**Toddalia asiatica* (L.) Lam. (Rutaceae). Shrubs include: \**Clausena anisata* (Willd.) Hook.f. ex Benth. (Rutaceae), *Myrsine africana* L. (Myrsinaceae), and \**Psychotria zombamontana* (Kuntze) Petit (Rubiaceae).

Flowering at the same time as *Margaritaria discoidea* were *Albizia gummifera*, *Apodytes dimidiata*, *Byrsocarpus orientalis*, *Dombeya rotundifolia*, *Erythrina abyssinica*, *Erythrina lysistemon*, and *Rothmannia fischeri*. One kilometer away in *Brachystegia* woodland *Brachystegia spiciformis* Harms (Leguminosae: Caesalpinioidae), *Cussonia arborea*, and *Parinari curatellifolia* Planchon ex Benth. (Chrysobalanaceae) were also flowering. Flowering just before the onset of the rains evidently avoids damage to the flowers by the initial heavy thunderstorms and allows development of fruits through the whole rainy season. Jacaranda trees (*Jacaranda mimosifolia* D. Don, Bignoniaceae) planted at Ngwazi and that flower at the start of the rains failed to set seed in 1986 and 1987 following heavy rains in 1985 and 1986, but did set seed in 1988 following the late and poor rains of 1987. Following a thunderstorm, many flowers from these trees are found knocked to the ground.

Of the associated species, those marked with an

asterisk (\*) in the above list also occur in the moist forests of the Mufindi escarpment 12 km east of Ngwazi, where the rainfall exceeds 1,600 mm/year. All these species are widespread Afromontane trees. Moist forest species occurring on termite mounds outside their normal climatic range have been observed in Ethiopia (Friis et al., 1987), and it seems likely that termite mounds offer a route whereby moist forest species can disperse across otherwise climatically unsuitable areas.

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#### LITERATURE CITED

- ARMSTRONG, J. E. & A. K. IRVINE. 1989. Flowering, sex ratios, pollen-ovule ratios, fruit set, and reproductive effort of a dioecious tree, *Myristica insipida* (Myristicaceae) in two different rain forest communities. Amer. J. Bot. 76: 74-85.
- FRIIS, I., M. G. GILBERT & K. VOLLESEN. 1987. Additions to the flora of Ethiopia, 2. Willdenowia 16: 531-564.
- RADCLIFFE-SMITH, A. 1987. Euphorbiaceae (part 1). In: R. M. Polhill (editor), Flora of Tropical East Africa. Balkema, Rotterdam.
- WEBSTER, G. L. 1979. A revision of *Margaritaria* (Euphorbiaceae). J. Arnold Arbor. 60: 403-444.
- Jon C. Lovett, Missouri Botanical Garden, P.O. Box 299, St. Louis, Missouri 63166-0299, U.S.A. (presently: Department of Botany, University of Dar es Salaam, P.O. Box 35060, Dar es Salaam, Tanzania) and Roy E. Gereau, Missouri Botanical Garden, P.O. Box 299, St. Louis, Missouri, 63166-0299, U.S.A.